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STATE OF NEW YORK
HUGH L. CAREY, Governor
DEPARTMENT OF TRANSPORTATION
WILLIAM C. HENNESSY, Commissioner
1220 WASHINGTON AVE., STATE CAMPUS, ALBANY, NEW YORK 12232

MONOLITHIC BRIDGE DECK EXPERIMENTAL COST EFFECTIVE RESTORATION LAKE STREET OVER 684I

materials bureau technical services subdivision

INITIAL REPORT

77-8

EXPERIMENTAL FEATURE PROJECT NO. 013676006
MONOLITHIC BRIDGE DECK
EXPERIMENTAL COST EFFECTIVE RESTORATION
LAKE STREET OVER 684I
INITIAL REPORT
AUGUST, 1977

R. Carey Babyak

LAKE STREET OVER 684I
BIN 1052950, WESTCHESTER COUNTY
CONTRACT D95196, PIN 8113.05.312

The structure carrying Lake Street over 684I consists of 4 simple spans with a total length of approximately 302 feet and width of 28 feet. Built in 1966, it had a 7 1/2" monolithic slab. Its rehabilitation consisted of various items of concrete removal followed by an overlay of Dow Latex Modified Concrete. The areas of the various concrete removal items were based on a survey conducted on 4/13/76 which consisted of visual inspection, chain drag, pachometer readings, and half cell potential readings. The overlay was placed on October 29 and 30, 1976. The overlay was designed to provide at least 2 1/4" of cover over the rebars. The minimum thickness of it was 1 1/2" and in many areas the overlay was 3" or more in depth. The overlay was placed full width.

On 11/5/76 the new overlay was inspected and a corrosion potential survey was conducted. This survey was done prior to the bridge opening to traffic.

The potential survey was conducted using wire connected to rebars, and led out by the curb, for grounds. Certain anchor bolts were also tested for use as grounds. By comparing potential values obtained with both types of grounds, it was determined the anchor bolts tested were also valid grounds.

The following observations concerning the overlay were made:

1. The entire bridge deck was checked using a chain drag for any debonded or "hollow" areas. None were found.

2. The tine texture appeared adequate in most areas though there were a few "open" areas. This could have resulted from the concrete being somewhat wetter in these areas.

3. The potential values of this first post construction survey increased in areas where the rebars remained in the chloride contaminated concrete and decreased in all other areas.

Another potential survey was completed in the spring on April 13, 1977 after one winters service on the overlay. This resurvey was done to confirm the first post construction potential survey. The following observations were made:

1. Potential values increased between the two post construction surveys. They increased in all 4 spans and in all types of removal areas.

2. The largest increases occurred in areas where the rebars were embedded in the old, chloride contaminated concrete.

Since the overall rise in potentials is not what was expected, and seems to indicate the beginning of active corrosion in previously non-corroded areas, we will monitor this deck at more frequent intervals. We will continue taking potential surveys on this deck, as well as sounding for delaminations.

As other ECER overlay data becomes available we will compare it to this first overlay.

LAKE ST. BRIDGE OVER 684I
TEST RESULTS (BEFORE OVERLAY)

SPAN & LANE	LONG. LOCATION	TRANSVERSE OFFSET	POTENTIAL (VOLTS)	DEPTH OF COVER (inches)	CHLORIDES (#/c.y.) 1"	2"	3"
Span 1							
E.B.	0+20	26'	.31	1 3/8	11.8	1.9	0
E.B.	0+65	18'	.26	1 3/8*	8.5	3.9	0.8
W.B.	0+65	2'	.45	1 1/2*	11.7	3.4	1.7
Span 2							
E.B.	0+20	26'	.22	2 1/2	16.0	3.3	0.3
E.B.	0+50	18'	.38	1	10.4	5.0	1.3
W.B	0+85	10'	.26	1 *	6.4	1.0	0.3
Span 3							
E.B.	0+25	18'	.32	1	11.6	2.6	1.1
E.B.	0+70	23'	.19	1 1/2*	6.6	0.7	0.4
W.B.	0+30	2'	.27	2 5/8*	5.7	0	0
W.B.	0+70	10'	.19	2 1/8*	1.1	0	0
Span 4							
E.B	0+35	26'	.28	1 3/8	5.7	0.5	0.3
W.B.	0+35	10'	.13	2 1/2	2.3	0	0

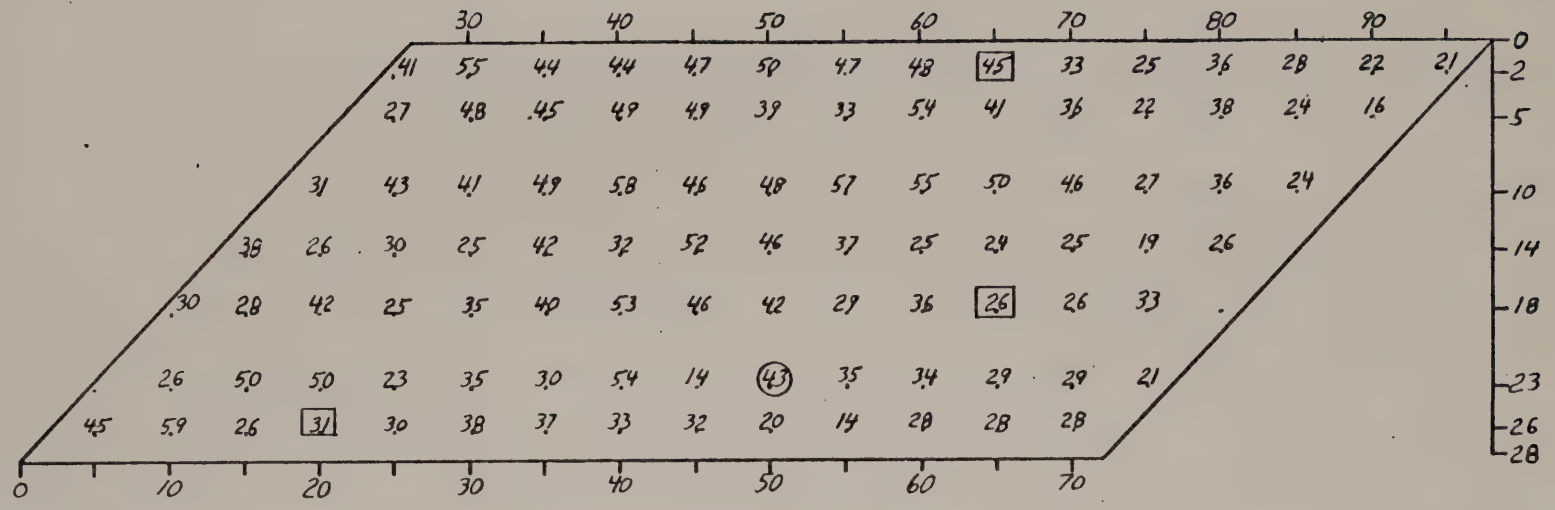
*Denotes interpolated reading

LAKE ST. BRIDGE OVER 684I
STRUCTURAL CORES (BEFORE OVERLAY)

CORE #	SPAN #	GRID LOCATION LONGITUDINAL	GRID LOCATION TRANSVERSE	CORE DEPTH	POTENTIAL	REBAR COVER PACH. MEAS.	REBAR COVER ACTUAL	REMARKS
1	West Approach	10' West of joint	23'	6"	-	-	6" to mesh	Concrete appeared sound
2	1	0+50	23'	6 1/2"	.43	7/8"	7/8"	Rebar had rust
3	2	0+80	18'	5"	.10	1 1/8"	1 1/4"	Rebar was clean
4	3	0+55	18'	4 1/4"	.35	1 1/4"	1"	Rebar had minor rust
5	4	0+45	26'	5"	.20	1"	1 1/8"	Rebar had minor rust
6	East Approach	30' East of joint	26'	9"	-	-	5 1/2" to mesh	Concrete appeared sound

POTENTIAL DATA TAKEN ON 4/13/76 (BEFORE OVERLAY)

READINGS IN HUNDREDTHS OF A VOLT



SPAN 1

SCALE 1 in. = 10 FT.

LAKE STREET OVER 684I

BIN 1052950

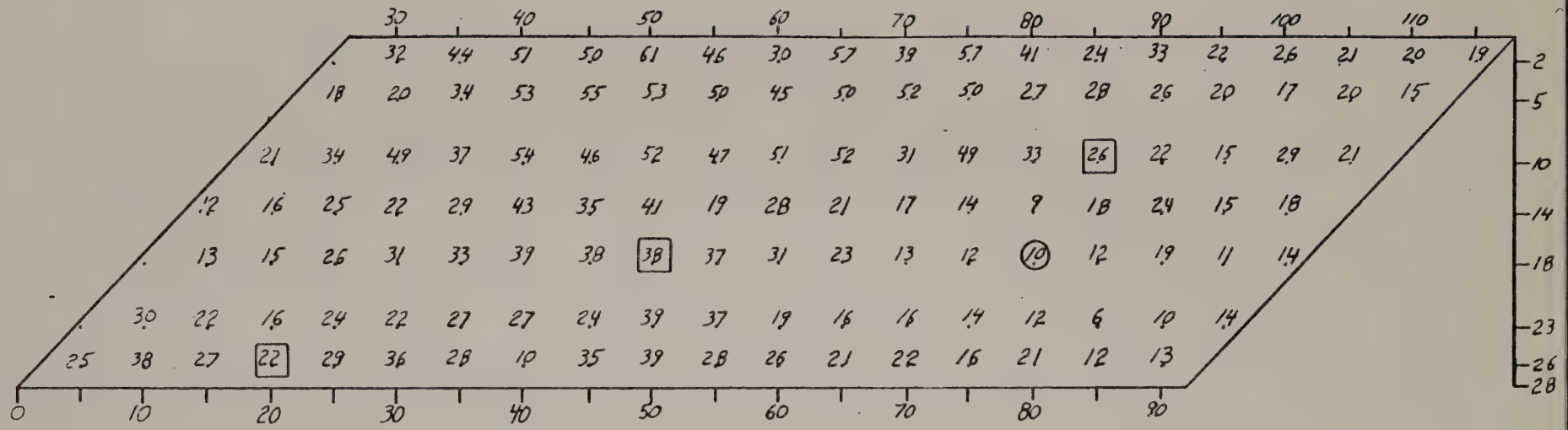
○ CALIBRATION CORE LOCATION

□ CHLORIDE LOCATION

NORTH

POTENTIAL DATA TAKEN ON 4/13/76 (BEFORE OVERLAY)

READINGS IN HUNDREDTHS OF A VOLT



SPAN 2

SCALE 1 in. = 10 FT.

LAKE STREET OVER 684I

BIN 1052950

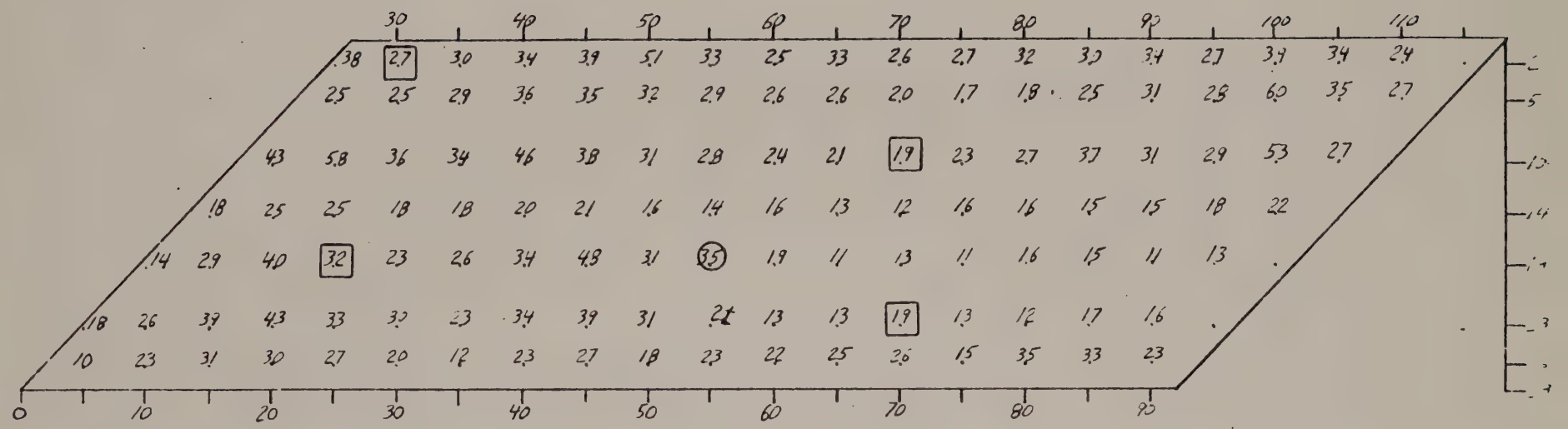
○ CALIBRATION CORE LOCATION

□ CHLORIDE LOCATION

NORTH

POTENTIAL DATA TAKEN ON 4/13/76 (BEFORE OVERLAY)

READINGS IN HUNDREDTHS OF A VOLT



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SCALE 1 in. = 10 FT.

LAKE STREET OVER 684I

BIN 1052950

○ CALIBRATION CORE LOCATION

□ CHLORIDE LOCATION

NORTH

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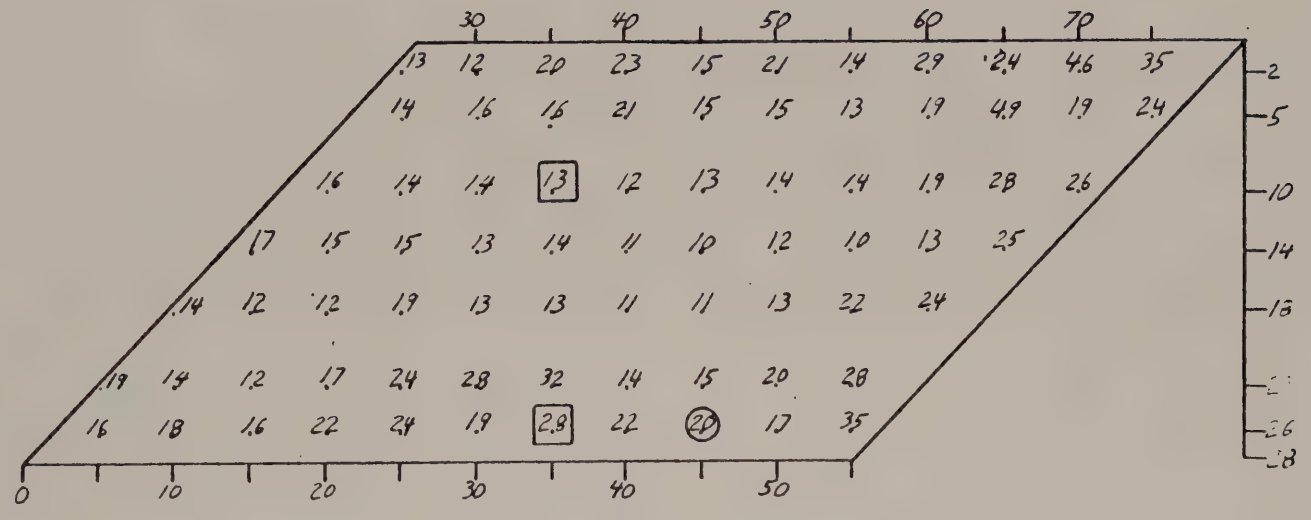


SPAN 4

SCALE 1 in. = 10 FT.

LAKE STREET OVER 684I

BIN 1052952

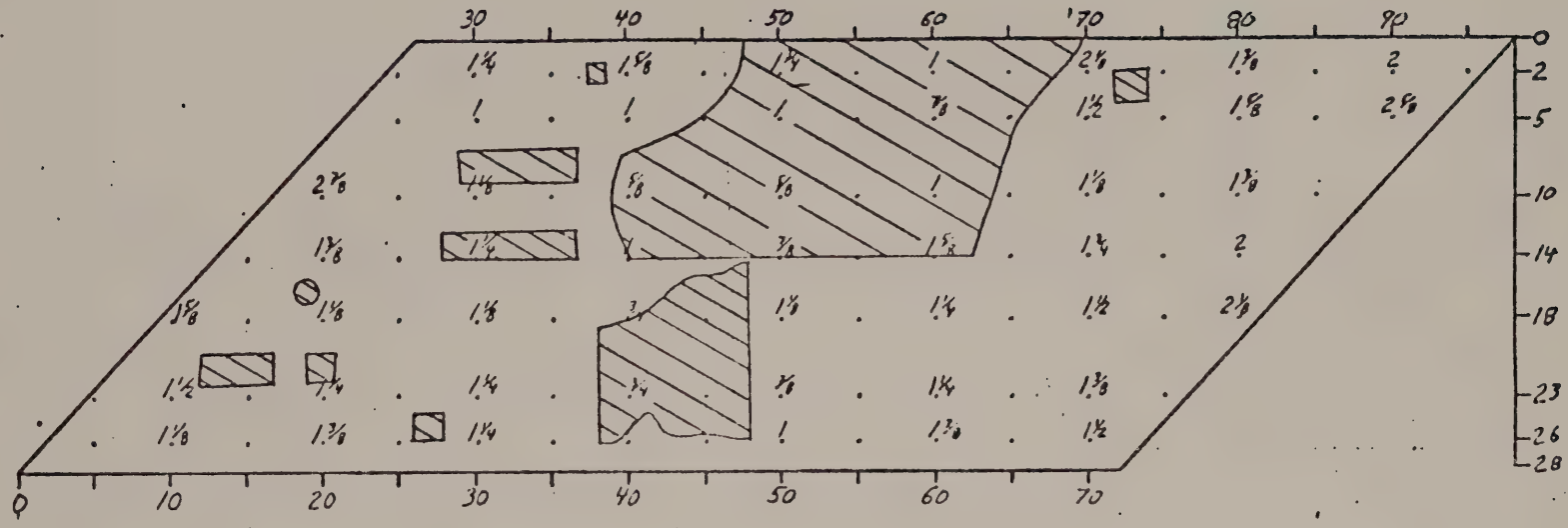
○ CALIBRATION CORE LOCATION

□ CHLORIDE LOCATION

NORTH

REINFORCING STEEL COVER (BEFORE OVERLAY)

READINGS IN INCHES



SPAN 1

SCALE 1 in. = 10 FT.

LAKE STREET OVER 6841

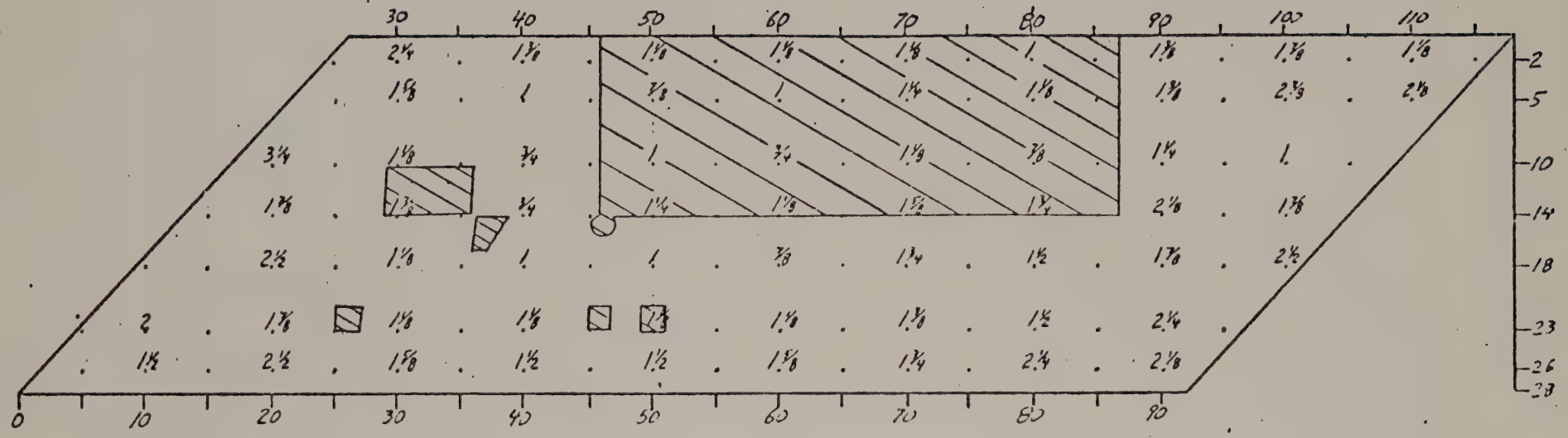
BIN 1052950

DELAMINATED OR HOLLOW AREA

NORTH

REINFORCING STEEL COVER (BEFORE OVERLAY)

READINGS IN INCHES



SPAN 2

SCALE 1 in. = 10 FT.

LAKE STREET OVER 6841

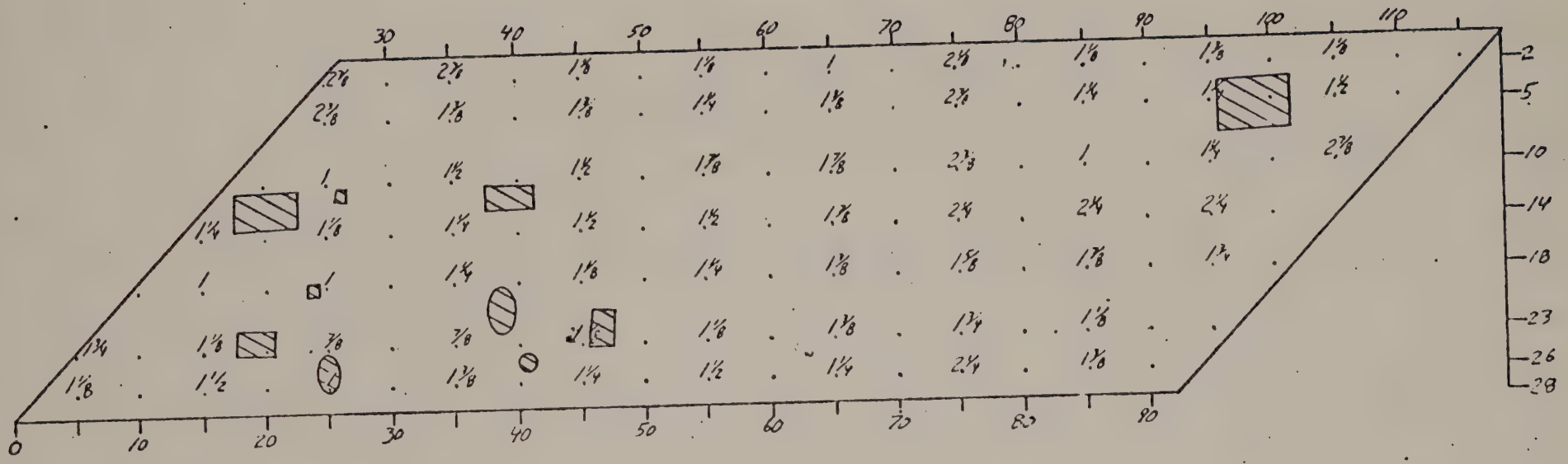
BIN 1052950

DELAMINATED OR HOLLOW AREA

NORTH

REINFORCING STEEL COVER (BEFORE OVERLAY)

READINGS IN INCHES



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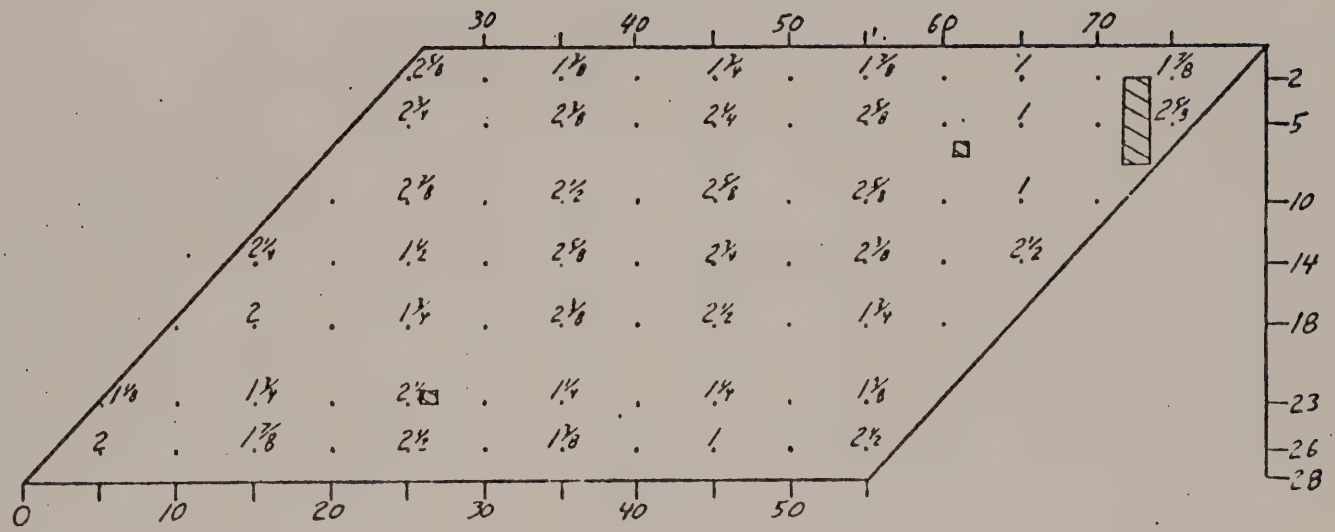
LAKE STREET OVER 684I

BIN 1052950

DELAMINATED OR HOLLOW AREA

REINFORCING STEEL COVER (BEFORE OVERLAY).

READINGS IN INCHES



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LAKE STREET OVER 6841

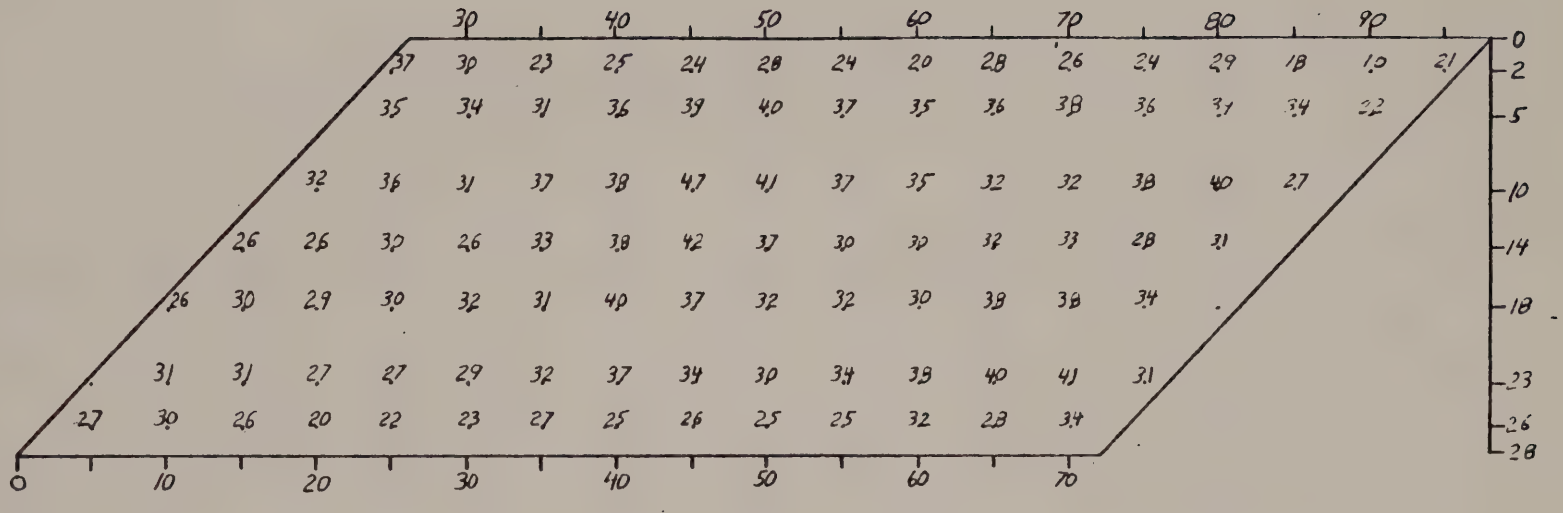
BIN 1052952

DELAMINATED OR HOLLOW AREA

NORTH

POTENTIAL DATA TAKEN ON 11/5/76 (AFTER OVERLAY)

READINGS IN HUNDREDTHS OF A VOLT



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BIN 1052950

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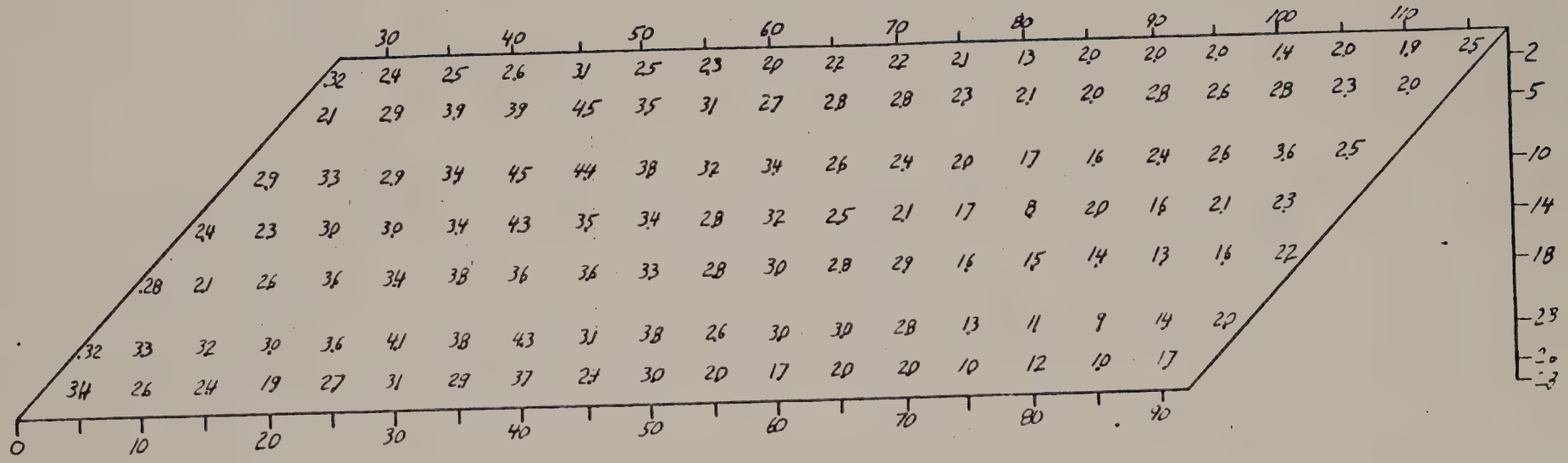

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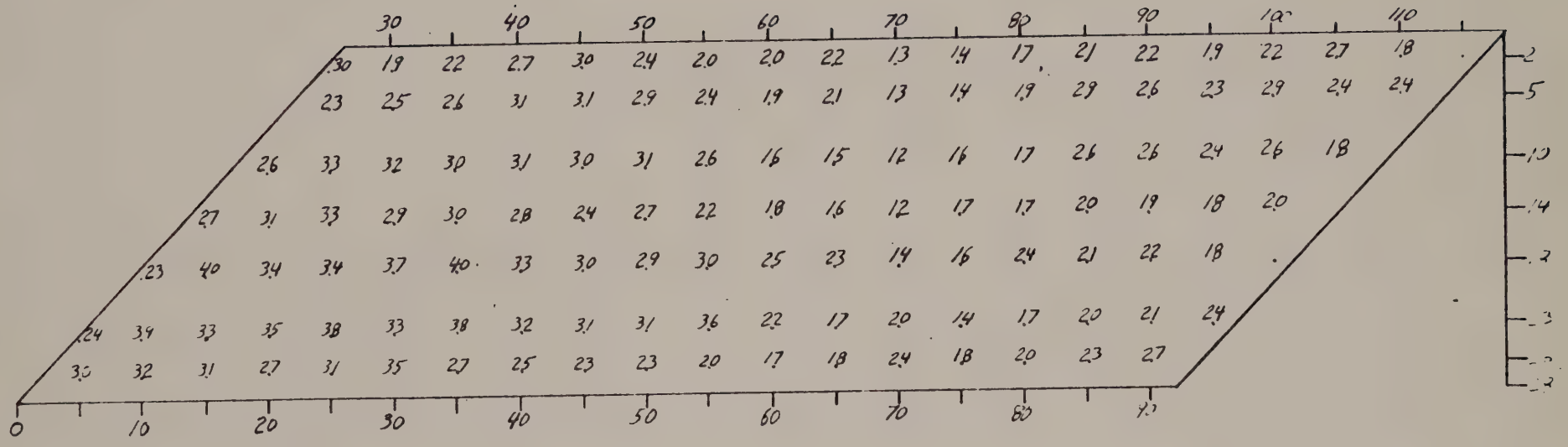

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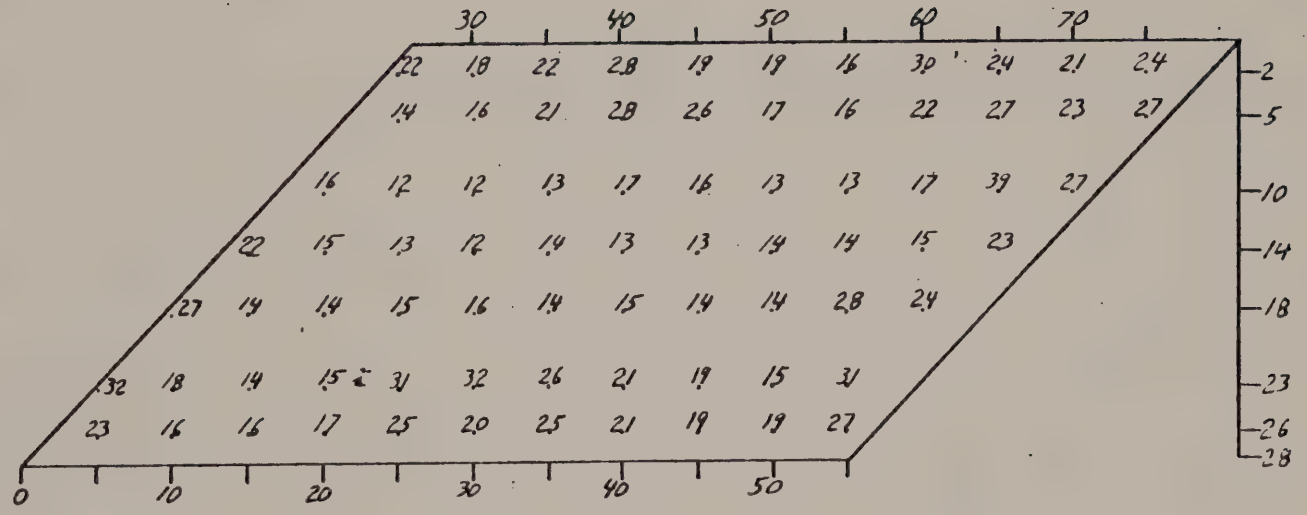

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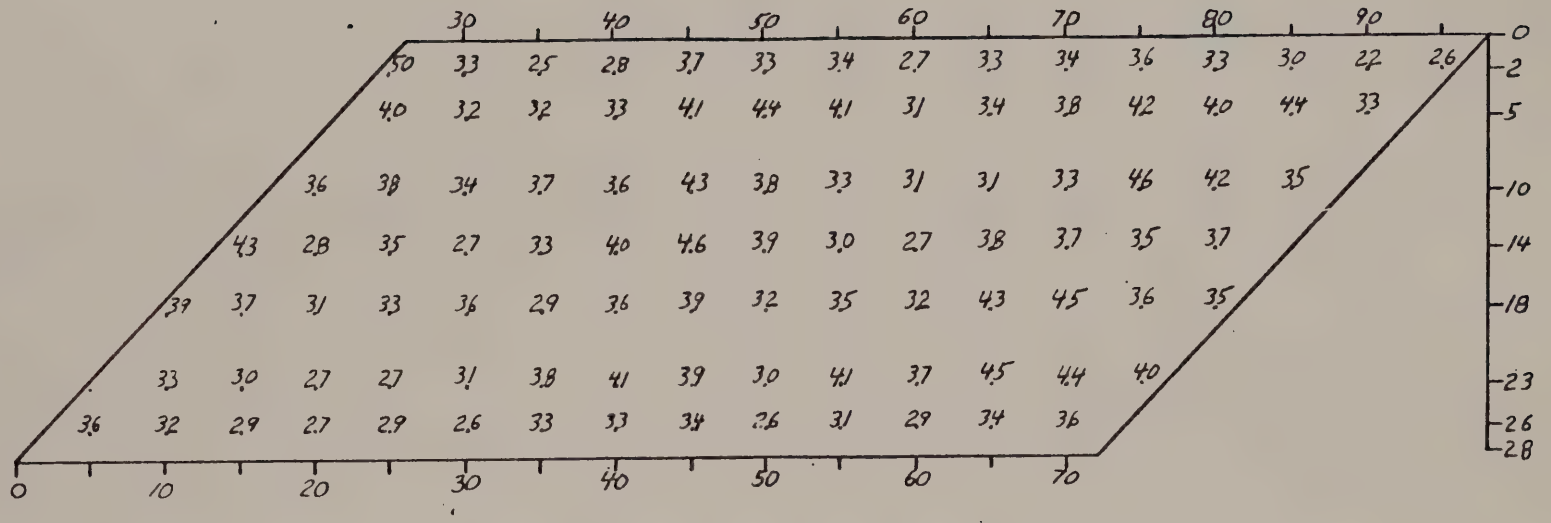

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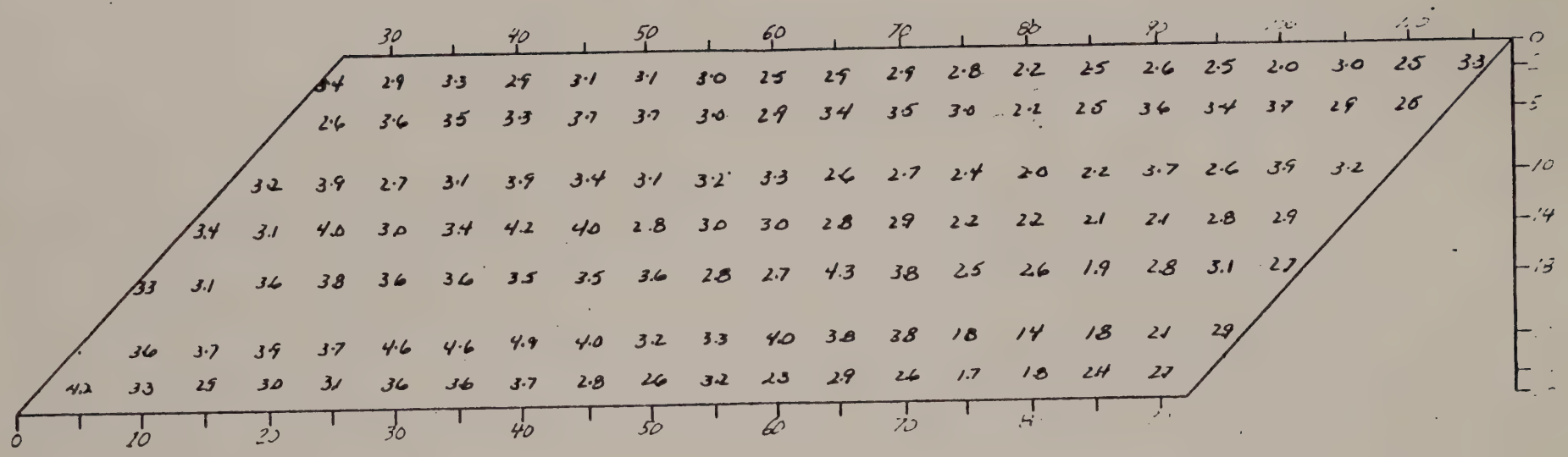

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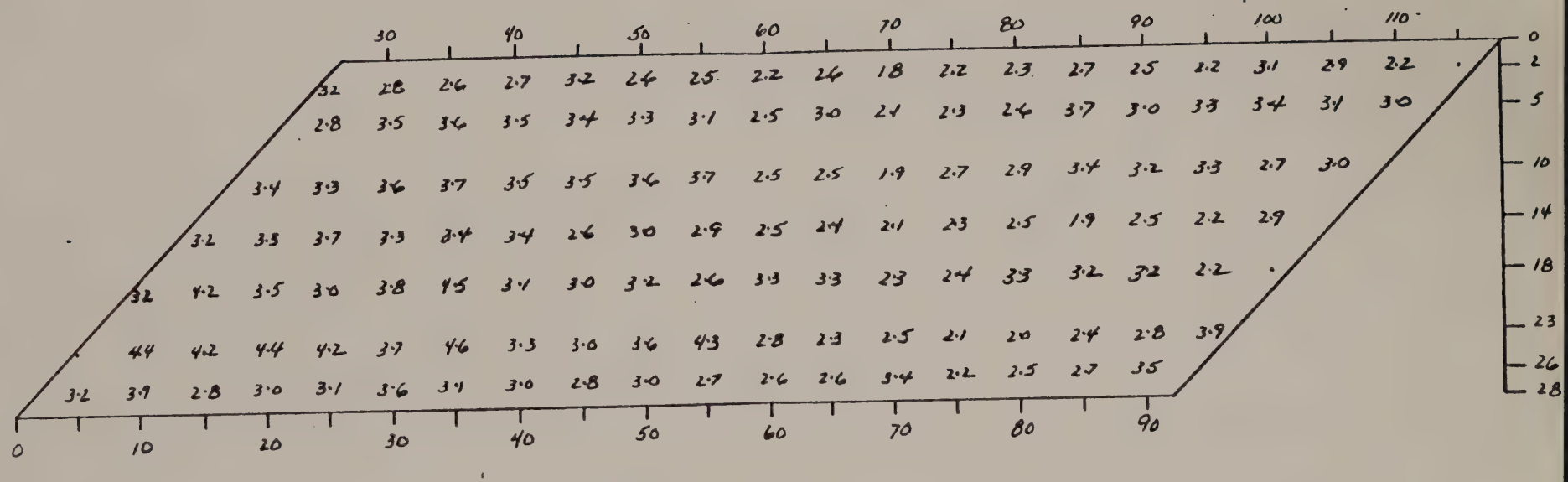

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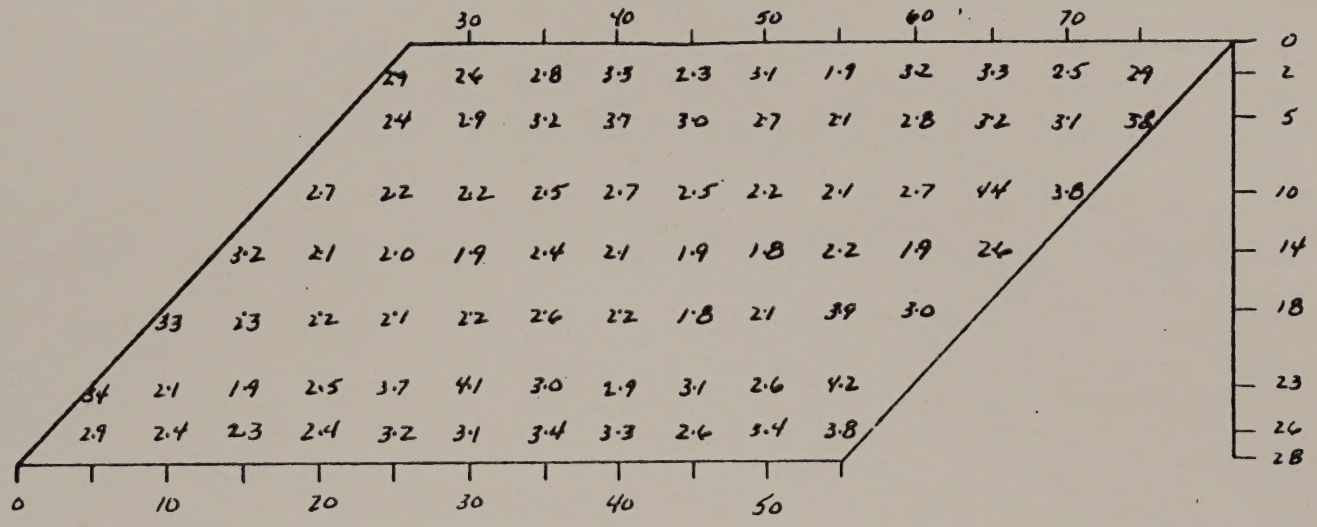

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